Revalorización de saberes ancestrales para la siembra de quinua (Bolivia, Plurinational State of)

DESCRIPTION

En la zona se está implementando el uso de maquinaria pesada, lo que provoca la degradación del suelo en la producción de quinua. A partir de ello, se quiere utilizar los saberes ancestrales (uso de tecnología mixta, saberes locales e innovación tecnológica) como una alternativa para mitigar la degradación de los suelos y la baja productividad del cereal (quinua).

En la comunidad de Copacana el período de siembra es desde el 15 de septiembre hasta el 10 de octubre. Antes de la siembra, la autoridad originaria junta a la comunidad y se hace un ritual de agradecimiento a la Pacha Mama, pidiendo el permiso para la siembra y una buena producción. cada familia se junta en las parcela, también los hijos, y siembran su parcela. La siembra manual consiste en hacer surcos manuales buscando la humedad y dejando unas diez semillas en cada hoyo, y cubriéndolo con una capa de 4 cm de tierra, manualmente, e irrigando directamente en hoyo. Al final, se cubre con una pajita para proteger la semilla del sol y de la evaporación del agua

Propósito de la tecnología: 1. Revalorización de saberes ancestrales para la producción de quinua.
2. Mitigación o reducción de la degradación (mitigación/ reducción).
3. Prevención de la degradación.

Ambiente natural / humano: Altiplano boliviano.

LOCATION

Location: Altiplano Bolivia, Bolivia, Plurinational State of

No. of Technology sites analysed:

Geo-reference of selected sites
- n.a.

Spread of the Technology:

In a permanently protected area?:

Date of implementation: more than 50 years ago (traditional)

Type of introduction
- [ ] through land users' innovation
- [x] as part of a traditional system (> 50 years)
- [ ] during experiments/ research
- [ ] through projects/ external interventions

CLASSIFICATION OF THE TECHNOLOGY

Main purpose
- [x] improve production
- [x] reduce, prevent, restore land degradation
- [ ] conserve ecosystem
- [ ] protect a watershed/ downstream areas – in combination with other Technologies
- [ ] preserve/ improve biodiversity
- [ ] reduce risk of disasters
- [ ] adapt to climate change/ extremes and its impacts
- [ ] mitigate climate change and its impacts
- [ ] create beneficial economic impact
- [ ] create beneficial social impact

Land use

Cropland
- Annual cropping: cereals - quinoa or amaranth

Number of growing seasons per year: 1

Water supply
- [x] rainfed
- [ ] mixed rainfed-irrigated
- [ ] full irrigation

Purpose related to land degradation
- [x] prevent land degradation
- [x] reduce land degradation
- [ ] restore/ rehabilitate severely degraded land
- [ ] adapt to land degradation
- [ ] not applicable

Degradation addressed

SLM group

SLM measures

- Revalorización de saberes ancestrales

agronomic measures - A3: Soil surface treatment

TECHNICAL DRAWING

Technical specifications

ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs

- Costs are calculated:
- Currency used for cost calculation: **Bolivianos**
- Exchange rate (to USD): 1 USD = 6.96 Bolivianos
- Average wage cost of hired labour per day: n.a

Most important factors affecting the costs

n.a.

Establishment activities

n.a.

Establishment inputs and costs

Specify input	Unit	Quantity	Costs per Unit (Bolivianos)	Total costs per input (Bolivianos)	% of costs borne by land users
Plant material					
Semillas	kg	6.0	60.0	360.0	100.0
Total costs for establishment of the Technology				**360.0**	
Total costs for establishment of the Technology in USD				*51.72*	

Maintenance activities

n.a.

NATURAL ENVIRONMENT

Average annual rainfall

- [x] < 250 mm
- [ ] 251-500 mm
- [ ] 501-750 mm
- [ ] 751-1,000 mm
- [ ] 1,001-1,500 mm
- [ ] 1,501-2,000 mm
- [ ] 2,001-3,000 mm
- [ ] 3,001-4,000 mm
- [ ] > 4,000 mm

Agro-climatic zone

- [ ] humid
- [ ] sub-humid
- [x] semi-arid
- [ ] arid

Specifications on climate

Boreal. No es el más adecuado para el altiplano, pero se acerca

Slope

- [ ] flat (0-2%)
- [ ] gentle (3-5%)
- [ ] moderate (6-10%)
- [x] rolling (11-15%)
- [ ] hilly (16-30%)
- [ ] steep (31-60%)
- [ ] very steep (>60%)

Landforms

- [ ] plateau/plains
- [ ] ridges
- [ ] mountain slopes
- [x] hill slopes
- [x] footslopes
- [ ] valley floors

Altitude

- [ ] 0-100 m a.s.l.
- [ ] 101-500 m a.s.l.
- [ ] 501-1,000 m a.s.l.
- [ ] 1,001-1,500 m a.s.l.
- [ ] 1,501-2,000 m a.s.l.
- [ ] 2,001-2,500 m a.s.l.
- [ ] 2,501-3,000 m a.s.l.
- [x] 3,001-4,000 m a.s.l.
- [ ] > 4,000 m a.s.l.

Technology is applied in

- [ ] convex situations
- [ ] concave situations
- [ ] not relevant

Soil depth

- [x] very shallow (0-20 cm)
- [ ] shallow (21-50 cm)
- [ ] moderately deep (51-80 cm)
- [ ] deep (81-120 cm)
- [ ] very deep (> 120 cm)

Soil texture (topsoil)

- [ ] coarse/ light (sandy)
- [x] medium (loamy, silty)
- [ ] fine/ heavy (clay)

Soil texture (> 20 cm below surface)

- [ ] coarse/ light (sandy)
- [ ] medium (loamy, silty)
- [ ] fine/ heavy (clay)

Topsoil organic matter content

- [ ] high (>3%)
- [ ] medium (1-3%)
- [ ] low (<1%)

Groundwater table

- [ ] on surface
- [ ] < 5 m
- [x] 5-50 m
- [ ] > 50 m

Availability of surface water

- [ ] excess
- [ ] good
- [ ] medium
- [x] poor/ none

Water quality (untreated)

- [x] good drinking water
- [ ] poor drinking water (treatment required)
- [ ] for agricultural use only (irrigation)
- [ ] unusable

Water quality refers to:

Is salinity a problem?

- [ ] Ja
- [ ] Nee

Occurrence of flooding

- [ ] Ja
- [ ] Nee

Species diversity

- [ ] high
- [ ] medium
- [ ] low

Habitat diversity

- [ ] high
- [ ] medium
- [ ] low

CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY

Market orientation
- [ ] subsistence (self-supply)
- [x] mixed (subsistence/ commercial)
- [ ] commercial/ market

Off-farm income
- [ ] less than 10% of all income
- [x] 10-50% of all income
- [ ] > 50% of all income

Relative level of wealth
- [ ] very poor
- [ ] poor
- [ ] average
- [ ] rich
- [ ] very rich

Level of mechanization
- [ ] manual work
- [ ] animal traction
- [x] mechanized/ motorized

Sedentary or nomadic
- [ ] Sedentary
- [ ] Semi-nomadic
- [ ] Nomadic

Individuals or groups
- [ ] individual/ household
- [x] groups/ community
- [ ] cooperative
- [ ] employee (company, government)

Gender
- [ ] women
- [ ] men

Age
- [ ] children
- [ ] youth
- [ ] middle-aged
- [ ] elderly

Area used per household
- [ ] < 0.5 ha
- [ ] 0.5-1 ha
- [ ] 1-2 ha
- [ ] 2-5 ha
- [x] 5-15 ha
- [ ] 15-50 ha
- [ ] 50-100 ha
- [ ] 100-500 ha
- [ ] 500-1,000 ha
- [ ] 1,000-10,000 ha
- [ ] > 10,000 ha

Scale
- [ ] small-scale
- [x] medium-scale
- [ ] large-scale

Land ownership
- [ ] state
- [ ] company
- [x] communal/ village
- [ ] group
- [ ] individual, not titled
- [ ] individual, titled

Land use rights
- [ ] open access (unorganized)
- [x] communal (organized)
- [ ] leased
- [ ] individual

Water use rights
- [ ] open access (unorganized)
- [x] communal (organized)
- [ ] leased
- [ ] individual

Access to services and infrastructure

health	poor	good
education	poor	good
technical assistance	poor	good
employment (e.g. off-farm)	poor	good
markets	poor	good
energy	poor	good
roads and transport	poor	good
drinking water and sanitation	poor	good
financial services	poor	good

IMPACTS

Socio-economic impacts

Crop production	decreased	increased	
production area (new land under cultivation/ use)	decreased	increased	
land management	hindered	simplified	Tiempo en su recuperación
expenses on agricultural inputs	increased	decreased	Abono
workload	increased	decreased	El incremento es bastante elevado

Socio-cultural impacts

food security/ self-sufficiency	reduced	improved	Garantizar la alimentación a la comunidad
cultural opportunities (eg spiritual, aesthetic, others)	reduced	improved	Recuperacion de saberes ancestrales
community institutions	weakened	strengthened	Revalorización de conocimientos ancestrales
Contribución al bienestar humano	disminuyó	incrementó	El cultivo tradicional de quinua contribuye al rescate y revalorización de técnicas y saberes ancestrales para el desarrollo productivo armónico con el medio ambiente.

Ecological impacts

water quantity	decreased	increased	Incremento de la retención del agua en el suelo
harvesting/ collection of water (runoff, dew, snow, etc)	reduced	improved	Cosecha de agua
surface runoff	increased	decreased	Evita la erosión del suelo

evaporation	increased ✓ decreased	Se evita la evaporación
soil moisture	decreased ✓ increased	Retención de la humedad
soil cover	reduced ✓ improved	Formación de pasturas
salinity	increased ✓ decreased	
soil organic matter/ below ground C	decreased ✓ increased	Recuperación de la materia orgánica
biomass/ above ground C	decreased ✓ increased	Formación de pasturas
plant diversity	decreased ✓ increased	Mayor cobertura vegetal
animal diversity	decreased ✓ increased	Incremento de ganados en la zona
emission of carbon and greenhouse gases	increased ✓ decreased	Mitigación del cambio climático
wind velocity	increased ✓ decreased	Regeneración de pasturas
Recuperación de la fertilidad del suelo	diminuyó ✓ incrementó	

Off-site impacts

COST-BENEFIT ANALYSIS

Benefits compared with establishment costs

Benefits compared with maintenance costs

CLIMATE CHANGE

-

ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology

- single cases/ experimental
- 1-10%
- 11-50%
- > 50%

Of all those who have adopted the Technology, how many have done so without receiving material incentives?

- 0-10%
- 11-50%
- 51-90%
- 91-100%

Has the Technology been modified recently to adapt to changing conditions?

- Ja
- Nee

To which changing conditions?

- climatic change/ extremes
- changing markets
- labour availability (e.g. due to migration)

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

Strengths: compiler's or other key resource person's view

- La interacción de saberes ancestrales con la tecnología contemporánea.
- La producción tradicional es menos riesgosa en la productividad de la quinua.
- Se recupera cobertura vegetal.

Weaknesses/ disadvantages/ risks: land user's viewhow to overcome

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's viewhow to overcome

- Lleva más tiempo realizar la siembra manual.

REFERENCES

Compiler
Meliza González Cáceres

Editors

Reviewer
Alexandra Gavilano
Deborah Niggli
Joana Eichenberger

Date of documentation: Jan. 23, 2015

Last update: Nov. 18, 2022

Resource persons
Meliza González Cáceres - SLM specialist
Eliezer Franco - SLM specialist
Stefano Brilli - SLM specialist
Leticia Resamano - SLM specialist

Full description in the WOCAT database
https://qcat.wocat.net/af/wocat/technologies/view/technologies_1237/

Linked SLM data
n.a.

Documentation was faciliated by

Institution
- n.a.

Project
- n.a.